

## CLAIMS

1. A polishing pad used for polishing a substrate, wherein grooves having a radial pattern are formed on a surface of the polishing pad, and an average value of the total volumes of all the groove parts existing immediately below the substrate in the grooves (an average value of the sum totals of the groove volumes in parts immediately below the substrate) is 0.06 to 0.23 when represented by [the average value of the sum totals of the groove volumes in parts immediately below the substrate ( $\text{mm}^3$ ) / area of the substrate ( $\text{mm}^2$ )].

2. A polishing pad used for polishing a substrate, wherein grooves having a radial pattern are formed on a surface of the polishing pad, and the grooves are formed so that a groove depth of the groove parts located nearer to the center than the substrate is shallower than a groove depth of the groove parts existing immediately below the substrate, and an intersection point where the grooves overlap each other at the central part of the radial pattern of the grooves does not exist immediately below the substrate.

3. The polishing pad according to Claim 1 or 2, wherein the grooves have a constant groove width and are formed so that angles between the grooves are more than the values

obtained by the mathematical formula 1 as follows.

(Mathematical formula 1)

An angle between the grooves =  $2 \times \sin^{-1} \left( \frac{\text{a width of the grooves}}{2 \times (\text{a distance from the center of the polishing pad to the center of the substrate} - \text{a radius of the substrate})} \right)$

4. The polishing pad according to any one of Claims 1 to 3, wherein the grooves have groove widths of 2.0 mm or less.

5. The polishing pad according to any one of Claims 1 to 4, wherein the polishing pad is a nonwoven type or a suede type.

6. A method for producing a substrate, comprising a step of polishing a substrate by using the polishing pad according to any one of Claims 1 to 5.

7. The method for producing a substrate according to Claim 6, wherein as the substrate to be polished, a silicon single crystal wafer or an SOI wafer is used.

8. A method for processing a polishing pad which is a method for forming grooves on a surface of a polishing pad used for polishing a substrate, comprising forming the grooves so as to have a radial pattern, and at this time forming the grooves so that an average value of the total

volumes of all the groove parts existing immediately below the substrate in the grooves (an average value of the sum totals of the groove volumes in parts immediately below the substrate) complies with a relation of 0.06 to 0.23 when represented by [the average value of the sum totals of the groove volumes in parts immediately below the substrate ( $\text{mm}^3$ ) / area of the substrate ( $\text{mm}^2$ )].

9. A method for processing a polishing pad which is a method for forming grooves on a surface of a polishing pad used for polishing a substrate, comprising forming the grooves so as to have a radial pattern, and at this time forming the grooves so that a groove depth of the groove parts located nearer to the center than the substrate is shallower than a groove depth of the groove parts existing immediately below the substrate and an intersection point where the grooves overlap each other at the central part of the radial pattern of the grooves does not exist immediately below the substrate.

10. The method for processing a polishing pad according to any one of Claims 8 and 9, wherein the grooves are formed so that angles between the grooves are more than values obtained by the mathematical formula 1 as follows.

(Mathematical formula 1)

An angle between the grooves =  $2 \times \sin^{-1}$  (a width of the grooves / (2 × (a distance from the center of the polishing

pad to the center of the substrate - a radius of the substrate))

11. The method for processing a polishing pad according to any one of Claims 8 to 10, wherein the grooves are formed so as to have groove widths of 2.0 mm or less.

12. The method for processing a polishing pad according to any one of Claims 8 to 11, wherein the polishing pad is a nonwoven type or a suede type.

13. A method for producing a substrate, comprising a step of polishing a substrate by using the polishing pad processed by the method according to any one of Claims 8 to 12.

14. The method for producing a substrate according to Claim 13, wherein as the substrate to be polished, a silicon single crystal wafer or an SOI wafer is used.